

## NOTES ON THE RENAL BLOOD-VESSELS OF RAPTORIAL BIRDS

BY F. L. FITZPATRICK

As has been noted in a previous paper, text-book descriptions of bird kidneys usually refer to the kidneys of the chicken or the pigeon. Usually these are illustrated as being composed of three more or less equal lobes.

In the case of Cooper's Hawk the anterior lobe is much larger than either the middle or the posterior (caudal) lobe. The anterior and middle lobes are continuous, but the posterior lobe is separate. On each side of the body the ureter appears on the ventral surface of the middle lobe (kidney), proceeds along the ventral surface of the posterior lobe, and thence posteriorly, where both oviducts open separately into the urodaeum.

With slight variations this appears to be substantially the same situation that is found in the Eastern Red-tailed Hawk, the Barred Owl, and the Great Horned Owl.

However, in the Turkey Vulture the situation is somewhat different. The anterior lobe of the kidney is large as in the preceding cases, but the remainder of each kidney is partially divided by constrictions into what appear to be three lobes, and the ureter emerges at the posterior end of the kidney.

In the case of the male Eastern Red-tailed Hawk (*Buteo b. borealis*) the main circulatory connections of the pelvic region proved to be as illustrated in the accompanying diagram.<sup>1</sup> The dorsal aorta passes between and dorsal to the kidneys in the midline. Two renal arteries enter the anterior lobes of the kidneys. Farther posteriorly two femoral arteries are given off which pass dorsal to the middle lobes of the kidneys, give off a branch in each case to the dorsal body wall, and extend laterally to the body wall, where they branch to the body wall and the region of the hind limbs. Although these arteries are figured as giving off renal arteries to the middle and posterior lobes of the kidneys (pigeon) in some text-books, this did not appear to be the case in hawks of the genus *Buteo*. Then the dorsal aorta gives off a pair of sciatic arteries which pass laterally, and dorsal to the posterior lobes of the kidneys.

As will be seen in Figure 6, a large iliac vein crosses the ventral surface of each kidney between the anterior and the middle lobe. Short branches from the anterior lobe connect with this vein in *Buteo l. lineatus* and presumably in *Buteo b. borealis* as well. The two iliac

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<sup>1</sup>Terminology as given by Parker.

veins unite in the midline to form a large postcaval vein, which of course is ventral to the dorsal aorta in position.

It will be noted that each iliac vein receives three main branches, one of which is a renal vein from the posterior lobe of the kidney. The second is an extension of the so-called "renal portal vein", which according to Parker gives off only a few minor afferent renal vessels in passing through this lobe.<sup>2</sup> This renal portal vein discharges into the femoral vein just distal to the point where the latter vessel joins

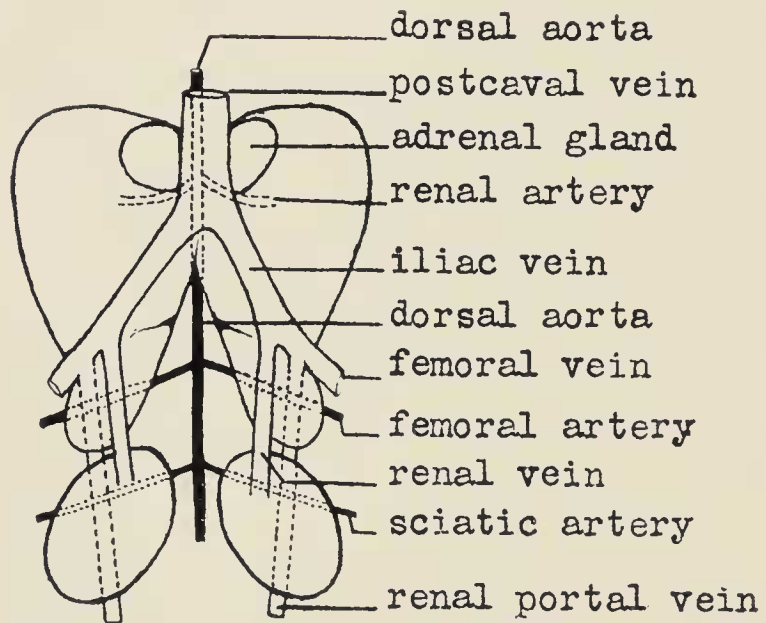


FIG. 6. Diagram of the renal blood-vessels in a Red-tailed Hawk.

the renal vein to form the iliac vein. The third is the femoral vein. It is with respect to these branches that variation among different species is most evident. Finally, two veins which are figured as "renal portal veins" in some text-books extend to the posterior lobes of the kidneys from the posterior end of the body.

The foregoing description of the larger blood vessels associated with the urinogenital organs appears to be more or less typical of the North American hawks and owls mentioned in the foregoing discussion, although it is subject to some variation among the species studied, and no doubt to somewhat less individual variation as well.

TEACHERS COLLEGE, COLUMBIA UNIVERSITY,  
NEW YORK, N. Y.

<sup>2</sup>Note: These branches might be efferent renal veins in this case. Parker's work refers to the pigeon.